

DEFORM-PROOF COMPOSITE BOARD

1 BACKGROUND OF THE INVENTION

2 1. Field of the Invention

3 The present invention relates to a board, and more particularly to a
4 composite board composed of a mediate board sandwiched between at least a
5 first board and at least a second board. The mediate board has a grain
6 perpendicular to a first grain of the first board and a second grain of the second
7 board such that when the first board and the second board are securely attached
8 to opposite sides of the mediate board, expansion and contraction of the mediate
9 board due to drastic temperature change is harmonized and therefore
10 deformation of the combination of the first board, second board and the mediate
11 board is avoided.

12 2. Description of Related Art

13 A conventional board comprises a solid board containing a plurality of
14 recesses defined in a bottom thereof and including a first side formed with a
15 tongue and a second side containing a groove therein.

16 Conventional boards are assembled into a wood covering such as a floor
17 or a wall by inserting the tongue of each of the boards into the groove of the
18 adjacent board. In such a manner, the configuration of the solid boards will be
19 distorted or deformed by stresses due to change of temperature or humidity of
20 the environment.

21 When the board is employed on the floor especially, because the floor is
22 a very good heat conductor and easily absorbs moisture from the environment,
23 cracks and deformation of the floor boards are common all over the world,
24 unless a fine wood is chosen to be the base of the combination of the

1 conventional composite board. However, using the fine board as the base of the
2 conventional composite board usually is not affordable for anyone who is
3 planning to change the floor.

4 To overcome the shortcomings, the present invention tends to provide an
5 improved composite board to mitigate and obviate the aforementioned problems.

6 SUMMARY OF THE INVENTION

7 The primary objective of the present invention is to provide an improved
8 composite board, a mediate board, at least a first board and at least a second
9 board together with the first board to sandwich the mediate board therebetween.
10 The mediate board has a grain and the first board has a first grain and the second
11 board has a second grain. Both the first and second grains are perpendicular to
12 the grain of the mediate board so that stress among the mediate board, the first
13 and the second board is harmonized and thus deformation of the composite
14 board is avoided.

15 Another objective of the present invention is that the mediate board has a
16 grain, the first board has a first grain and the second has a second grain. The
17 grain of the mediate board is perpendicular to both the first and the second grains
18 so that stress among the first board, the mediate board and the second board is
19 harmonized and deformation of the composite board of the present invention is
20 avoided.

21 Other objects, advantages and novel features of the invention will
22 become more apparent from the following detailed description when taken in
23 conjunction with the accompanying drawings.

24 BRIEF DESCRIPTION OF THE DRAWINGS

1 Fig. 1 is an exploded perspective view of the composite board of the
2 present invention;

3 Fig. 2 is an exploded perspective view of the second embodiment of the
4 composite board of the present invention;

5 Fig. 3 is an exploded perspective view of the third embodiment of the
6 composite board of the present invention;

7 Fig. 4 is an exploded perspective view of the fourth embodiment of the
8 composite board of the present invention;

9 Fig. 5 is an exploded perspective view of the fifth embodiment of the
10 composite board of the present invention;

11 Fig. 6 is an exploded perspective view of the sixth embodiment of the
12 composite board of the present invention; and

13 Fig. 7 is an exploded perspective view of the seventh embodiment of the
14 composite board of the present invention.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

16 With reference to Fig. 1, the composite board in accordance with the
17 present invention includes a first board (1), a mediate board (2), a second board
18 (3) and a third board (4).

19 The first board (1) has a first grain (11). The second board (3) has a
20 second grain (31) and the third board (4) has a third grain (41). It is to be noted
21 that the first grain (11) is perpendicular to the second grain (31) which is
22 perpendicular to the third grain (41). From the accompanying drawings, the first
23 grain (11) is latitudinal, which is the same as that of the third grain (41). The
24 second grain (31) is longitudinal and is thus perpendicular to both the first and

1 third grains (11,41). The mediate board (2) is provided with a notch (21) defined
2 in a side face of the mediate board (2), a tongue (22) oppositely formed relative
3 to the notch (21) and multiple latitudinal slits (23) latitudinally defined across
4 the mediate board (2). When the composite board is assembled to securely
5 engage the first board (1), the mediate board (2), the second board (3) and the
6 third board (4) together, due to the orientation differences among the first grain
7 (11), the second grain (31) and the third grain (41), deformation of the composite
8 board resulting from the temperature and/or humidity change in the composite
9 board of the present invention is harmonized. That is, for example, when the
10 second board (3) has expanded and the third board (4) has expanded as a
11 consequence of additional moisture in the environment, differences between the
12 expansion coefficients of the second board (3) and the third board (4)
13 respectively cause different expansion in the second board (3) and the third
14 board (4). However, due to the differences between the second grain (31) and the
15 third grain (41), the expansion differences are counteracted by each other so that
16 over expansions of the second and the third boards (3,4) are avoided. The same
17 principle applies to the first board (1).

18 The provision of the latitudinal slits (23) in the mediate board (2) is able
19 to provide space to accommodate excessive volume of the mediate board (2)
20 when expanded so that stress in the composite board is obviated and thus cracks
21 in the composite board are avoided.

22 With reference to Fig. 2, it is noted that the second embodiment of the
23 composite board has a structure almost the same as that of the first embodiment
24 shown in Fig. 1. The only difference therebetween is that the mediate board (2)

1 further has multiple longitudinal slits (24) each intersecting with the latitudinal
2 slits (23) to reinforce the structural integrity.

3 With reference to Fig. 3, it is noted that the third embodiment of the
4 composite board has a structure almost the same as that of the first embodiment
5 shown in Fig. 1. The only difference therebetween is that the mediate board (2)
6 has multiple right slanted slits (25) intersecting with each one of the latitudinal
7 slits (23), and multiple left slanted slits (26) each intersecting with each one of
8 the latitudinal slits (23) and intersecting with a corresponding one of the right
9 slanted slits (25). The provision of the right and left slanted slits (25,26) is to
10 increase structural integrity of the composite board of the present invention.

11 With reference to Fig. 4, the composite board in accordance with the
12 present invention includes a first board (5), a second board (6), a mediate board
13 (7), a third board (8) and a fourth board (9).

14 The first board (5) has a first grain (51), the second board (6) has a
15 second grain (61), the third board (8) has a third grain (81) and the fourth board
16 (9) has a fourth grain (91). The first and second boards (5,6) are provided on one
17 side of the mediate board (7) and the third and the fourth boards (8,9) are
18 provided to engage with the mediate board (7) and opposite to the combination
19 of the first and second boards (5,6). The first board (5) has a first grain (51) and
20 the second board (6) has a second grain (61) perpendicular to the first grain (51).
21 The third board (8) has a third grain (81) and the fourth board (9) has a fourth
22 grain (91) perpendicular to the third grain (81). The mediate board (7) has a
23 notch (71) defined in a side face of the mediate board (7), a tongue (72)
24 oppositely formed with respect to the notch (71), multiple top slits (73) defined

1 in a top face of the mediate board (7) and multiple bottom slits (74) defined in a
2 bottom face of the mediate board (7).

3 When the composite board of this preferred embodiment of the present
4 invention is assembled to securely engage the first board (5), the second board
5 (6), the mediate board (7), the third board (8) and the fourth board (9) together,
6 because the first grain (51) is perpendicular to the second grain (61) and the third
7 grain (81) is perpendicular to the fourth grain (91), deformation of the composite
8 board from the change in humidity and temperature in the environment is
9 avoided.

10 The provision of the top and bottom slits (73,74) is to increase the
11 structural integrity of the composite board so that when the composite board has
12 expanded due to a rise in temperature, as a result of different expansion
13 coefficients in the first, second, third and fourth boards (5,6,8,9) the expansion is
14 accommodated by the slits (73,74).

15 With reference to the embodiment in Fig. 5, the structure in this
16 embodiment is almost the same as that disclosed in Fig. 4. The only difference is
17 that the mediate board (7), except for the top and bottom slits (73,74), further has
18 multiple longitudinal slits (75) defined in opposite side faces of the mediate
19 board (7) to respectively intersect with the top slits (73) and the bottom slits (74).

20 With reference to Fig. 6, the structure in this embodiment is almost the
21 same as that disclosed in Fig. 4. The only difference is that the mediate board (7),
22 except for the top and bottom slits (73,74), further has multiple left slanted slits
23 (76) defined in the top face of the mediate board (7) to intersect with the top slits
24 (73) and multiple right slanted slits (77) defined in the bottom face of the

1 mediate board (7) to intersect with the bottom slits (74). The provision of the top
2 and bottom slits (73,74) and the right and left slanted slits (76,77) is to increase
3 the structural integrity of the composite board of the present invention so that
4 when stress occurs in the composite board due to the different expansion
5 coefficients of each of the boards, additional space is provided for the excessive
6 volume of the expanded composite board from change of temperature and/or
7 humidity.

8 Different from what is disclosed in the foregoing embodiments, this
9 embodiment shown in Fig. 7 has a first board (1a), a mediate board (2a) and a
10 second board (3a). The first board (1a) has a grain (11a), the mediate board (2a)
11 has a grain (21a) and the second board (3a) has a second grain (31a). The first
12 grain (11a) is perpendicular to the grain (21a) which is perpendicular to the
13 second grain (31a). The mediate board (2a) further has a notch (22a) defined in a
14 side face of the mediate board (2a), a tongue (23a) oppositely formed relative to
15 the notch (22a), multiple latitudinal slits (24a) defined in a side face of the
16 mediate board (2a) and multiple longitudinal slits (25a) defined in the side face
17 to intersect with the latitudinal slits (24a).

18 It is to be understood, however, that even though numerous
19 characteristics and advantages of the present invention have been set forth in the
20 foregoing description, together with details of the structure and function of the
21 invention, the disclosure is illustrative only, and changes may be made in detail,
22 especially in matters of shape, size, and arrangement of parts within the
23 principles of the invention to the full extent indicated by the broad general
24 meaning of the terms in which the appended claims are expressed.